

*Committed to the Future of Rural Communities***4280-B APPENDIX B WIND, LARGE****TECHNICAL REPORTS FOR PROJECTS WITH  
TOTAL ELIGIBLE PROJECT COSTS GREATER THAN \$200,000**

The Technical Report for projects with total eligible project costs greater than \$200,000 (and for any other project that must submit a Technical Report under this appendix) must demonstrate that the project design, procurement, installation, startup, operation, and maintenance of the renewable energy system or energy efficiency improvement will operate or perform as specified over its design life in a reliable and a cost-effective manner. The Technical Report must also identify all necessary project agreements, demonstrate that those agreements will be in place, and that necessary project equipment and services are available over the design life.

All technical information provided must follow the format specified in Sections 1 through 10 of this appendix. Supporting information may be submitted in other formats. Design drawings and process flowcharts are encouraged as exhibits. A discussion of each topic is not necessary if the topic is not applicable to the specific project. Questions identified in the Agency's technical review of the project must be answered to the Agency's satisfaction before the application will be approved. The applicant must submit the original technical report plus one copy to the Rural Development State Office. Renewable energy projects with total eligible project costs greater than \$400,000 and for energy efficiency improvement projects with total eligible project costs greater than \$200,000 require the services of a licensed professional engineer (PE) or team of PEs. Depending on the level of engineering required for the specific project or if necessary to ensure public safety, the services of a licensed PE or a team of licensed PEs may be required for smaller projects.

**Section 9. Wind, Large**

The technical requirements specified in this section apply to wind energy systems, which are, as defined in § 4280.103, wind energy projects for which the rated power of the individual wind turbine(s) is larger than 100kW.

(a) Qualifications of project team. The large wind project team should consist of a project manager, a meteorologist, an equipment supplier, a project engineer, a primary or general contractor, construction contractor, and a system operator and maintainer and, in some cases, the owner of the application or load served by the system. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

- (1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder

constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developers risk;

(2) Discuss the large wind turbine manufacturers and other equipment suppliers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, project engineer, and construction contractor qualifications for engineering, designing, and installing large wind systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available;

(4) Discuss the qualifications of the meteorologist, including references; and

(5) Describe system operator's qualifications and experience for servicing, operating, and maintaining the system for the proposed application. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) Agreements, permits, and certifications. Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (6).

(1) Identify zoning, building, and electrical code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify land use agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(3) Identify available component warranties for the specific project location and size.

(4) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase arrangements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements.

(5) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G, of this title.

(6) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) Resource assessment. Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Projects greater than 500kW must obtain wind data from the proposed project site. For such projects, describe the proposed measurement setup for the collection of the wind resource data. For proposed projects with an established wind resource, provide a summary of the wind resource and the specifications of the measurement setup. Large wind systems larger than 500kW in size will typically require at least 1 year of on-site monitoring. If less than 1 year of data is used, the qualified meteorological consultant must provide a detailed analysis of the correlation between the site data and a nearby, long-term measurement site.

(d) Design and engineering. Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Large wind systems must be engineered by a qualified party. Systems must be engineered as complete, integrated systems with matched components. The engineering must be comprehensive, including site selection, turbine selection, tower selection, tower foundation, design of the local collection grid, interconnection equipment selection, and system monitoring equipment. For stand-alone, non-grid applications, engineering information must be provided that demonstrates appropriate matching of wind turbine and load.

(1) Provide a concise, but complete, description of the large wind project, including location of the project, proposed turbine specifications, tower height and type of tower, the collection grid, interconnection equipment, and monitoring equipment. Identify possible vendors and models of major system components. Provide the expected system energy production based on available wind resource data on a monthly and annual basis. For wind projects larger than 500kW in size, provide the expected system energy production over the life of the project, including a discussion on inter-annual variation using a comparison of the on-site monitoring data with long-term meteorological data from a nearby monitored site.

(2) Describe the project site and address issues such as site access, proximity to the electrical grid or application load, environmental concerns with emphasis on historic properties, visibility, noise, bird and bat populations, and wildlife habitat destruction and/or fragmentation, construction, and installation issues and whether special circumstances such as proximity to airports exist.

(e) Project development schedule. Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) Project economic assessment. Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the proposed project. Provide a detailed analysis and description of project costs, including project management, resource assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing,

professional services, and operations and maintenance costs. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. Provide a detailed analysis and description of annual project revenues, including electricity sales, production tax credits, revenues from green tags, and any other production incentive programs throughout the life of the project. Provide a description of planned contingency fees or reserve funds to be used for unexpected large component replacement or repairs and for low productivity periods. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) Equipment procurement. Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Large wind turbines may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) Equipment installation. Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment, including cranes or other devices, needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) Operations and maintenance. Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

- (1) Ensure that systems must have at least a 3-year warranty for equipment. Provide information regarding turbine warranties and availability of spare parts;
- (2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance schedules for the mechanical and electrical systems and system monitoring and control requirements;
- (3) Provide information that supports expected design life of the system and timing of major component replacement or rebuilds;
- (4) Provide and discuss the risk management plan for handling large, potential failures of major components such as the turbine gearbox or rotor. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing;

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator; and

(6) For owner maintained portions of the system, describe any unique knowledge, skills, or abilities needed for service operations or maintenance.

(j) Dismantling and disposal of project components. Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.